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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention]This invention relates to the battery pack which carried out the internal organs of the substrate which has an electric circuit for controlling a cell.

[0002]

[Description of the Prior Art]In recent years, the battery pack to which the note type personal computer, the cellular phone, etc. carried out the internal organs of the substrate which has an electric circuit for controlling a cell by multi-functionalization and portable-izing of apparatus is used. Such an electric circuit is called a battery management unit (it is henceforth called BMU), and manages the state of cells, such as charge of a cell, discharge times, and remaining capacity.

[0003]However, when this battery pack unifies an up-and-down case by ultrasonic welding, the electrical part on the substrate which has BMU by supersonic vibration may be damaged. For this reason, as for the battery pack in which the internal organs of the substrate which has BMU were carried out, in order to join an up-and-down case, it is common to have taken the composition which uses hot welding and adhesives and unifies a joined part.

[0004]

[Problem(s) to be Solved by the Invention]However, in the above-mentioned conventional composition, since the up-and-down case is unified using hot welding and adhesives, workability is bad and a manufacturing cost is applied. This joined part spoils the appearance as a battery pack. In order to see the history of a battery pack furthermore and to take out and inspect the substrate which has BMU, The joined part of the up-and-down case needed to be cut and taken out, using a new up-and-down case, after the inspection needed to join this up-and-down case, and needed to reconstruct the battery pack, and there was a problem that the maintenance of a battery pack took time.

[0005]

[Means for Solving the Problem]In order to solve the above-mentioned technical problem a battery pack of this invention, A case which joined an up-and-down case to one, and a power supply battery accommodated in an inside of this case, Are the 1st printed circuit board that has a terminal for external I/O, and the 2nd printed circuit board that has an electric circuit which performs control of a cell the battery pack which it had, and this battery pack, A case interior shall be equipped with the 2nd printed circuit board, enabling free desorption, and a lid which enables receipts and payments of the 2nd printed circuit board from a battery pack shall be formed in a case.

[0006]

[Embodiment of the Invention]The invention according to claim 1 is the battery pack made into the aforementioned contents, especially as for this battery pack, a case interior shall be equipped, enabling free desorption of the 2nd printed circuit board, and the lid which enables receipts and payments of the 2nd printed circuit board from a battery pack shall be formed in a case. Even if the up-and-down case could be unified by ultrasonic welding, improvement in productivity was aimed at and it performed ultrasonic welding by this, damaging an electrical part was lost.

[0007]The 2nd printed circuit board could certainly be fixed by attaching a rib to this lid, and vibration resistance nature was able to be improved. The maintenance of this battery pack became easy. As well as the above when failure of the electronic parts of the substrate which has BMU arises, a substrate is removed, and it can exchange for a new substrate easily.

[0008]The case in which the invention according to claim 4 joined the up-and-down case to one, The power supply battery accommodated in the inside of this case, and the 1st printed circuit board that has a terminal for external I/O, Are the battery pack provided with the 2nd printed circuit board that has an electric circuit which controls a cell, and especially this battery pack, Equip the 1st and the 2nd printed circuit board with the connector for substrate connection, and the 1st printed circuit board and 2nd printed circuit board are connected by this connector for substrate connection, and a case interior is equipped with the 2nd printed circuit board by it, enabling free desorption, The lid which enables receipts and payments of the 2nd printed circuit board from a battery pack shall be formed in a case. Even if the up-and-down case could be unified by ultrasonic welding, improvement in productivity was aimed at and it performed ultrasonic welding by this, damaging an electrical part was lost.

[0009]The 2nd printed circuit board could certainly be fixed by attaching a rib to this lid, and vibration resistance nature was able to be improved. The maintenance of this battery pack became easy. As well as the above when failure of the electronic parts of the substrate which has BMU arises, a substrate is removed, and it can exchange for a new substrate easily.

[0010]The process of fixing to one case the cell block which the invention according to claim 7

becomes from one piece or two or more cells, The process which carries out the series connection of the 1st printed circuit board that has a terminal for external I/O, and a connector for substrate connection to a cell block and with which one case is equipped, The process of fitting in the case of another side provided with the lid, and one case, and the process of unifying the fitting part of both this case by ultrasonic welding, The connector for substrate connection of the 2nd printed circuit board that has the electric circuit and the connector for substrate connection which control a cell is connected to the connector for substrate connection of the 1st printed circuit board, It is a manufacturing method of the battery pack which has a process with which one case is equipped enabling free desorption, and the process of equipping the case of another side with a lid.

[0011]

[Example]Hereafter, the example of this invention is explained in detail.

[0012]That composition is explained below, the exploded perspective view of the battery pack in the example of this invention being shown in drawing 1, and referring to this drawing 1.

[0013]The cell block 1 which carried out the series connection of the eight nickel hydrogen storage batteries is fixed to the resin case 2. The series connection of the printed circuit board 5 which has the terminal 3 for external I/O and the connector 4 for substrate connection is carried out to the cell block 1 with the lead 6, and the resin case 2 is equipped. The resin case 8 and the resin case 2 provided with the lid 7 are fitted in. The fitting part of both this resin case is unified by ultrasonic welding. The printed circuit board 10 is provided with the electric circuit and the connector 9 for substrate connection which control a cell.

The connector 9 for substrate connection is connected to the connector 4 for substrate connection of the printed circuit board 5, and the resin case 2 is equipped.

The perspective view which connects the connector 9 for substrate connection of the printed circuit board 10 to the connector 4 for substrate connection of the printed circuit board 5 at this time is shown in drawing 2. As shown in drawing 2, the connector 4 for connection and the connector 9 for connection can be freely desorbed by an insertion formula.

[0014]The resin case 8 was equipped with the lid 7, and the battery pack of the example in this invention was constituted. The perspective view of this battery pack is shown in drawing 3. The rib 11 which fixes the printed circuit board 10 is formed in this lid 7. The printed circuit board 10 which has an electric circuit of the battery pack in this example, In order to be able to take out and exchange and to attach the printed circuit board 10 by opening the lid 7, the connector 9 for substrate connection of the printed circuit board 10 is connected to the connector 4 for substrate connection of the printed circuit board 5, and it is made to equip with the lid 7.

Although the lid 7 was formed in the upper surface of the resin case 8, if it is in a dismountable position about the printed circuit board 10 which has electronic circuits, such as the side of the resin cases 2 and 8, an effect equivalent to an example will be acquired.

[0015]

[Effect of the Invention] The case in which this invention joined the up-and-down case to one as mentioned above, and the power supply battery accommodated in the inside of this case, Are the 1st printed circuit board that has a terminal for external I/O, and the 2nd printed circuit board that has an electric circuit which performs control of a cell the battery pack which it had, and this battery pack, By equipping a case interior with the 2nd printed circuit board, enabling free desorption, and forming in the case the lid which enables receipts and payments of the 2nd printed circuit board from a battery pack, it can unify without damaging an up-and-down case and damaging an electrical part by ultrasonic welding, and improvement in productivity can be aimed at. Since the 2nd printed circuit board is made enabling free desorption, the maintenance of a battery pack can be performed easily. The 2nd printed circuit board can certainly be fixed by attaching a rib to a lid, and vibration resistance nature can be improved.

[Translation done.]